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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,793	12/06/2001	Ramesh C. Kainthla	011221	9846

22876 7590 06/04/2003

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EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 06/04/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/006,793

Applicant(s)

KAINTHLA ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 03/12/02 was considered by the examiner.

Drawings

2. The drawings filed on 12/06/01 have been accepted.

Claim Objections

3. It is noted that claim 23 is not present in the claim section of the instant application. Thus, the numbering of claims 24-25 is improper. It is noted that claims must be numbered consecutively beginning with the number next following the highest numbered claims presented in the claim section of the disclosure. Misnumbered claims 24-25 have been renumbered 23-24.

Claim Language Suggestion

4. In claims 4, 8, 12 and 19: it is suggested to recite binding agents by their general chemical nomenclature e.g. polytetrafluoroethylene instead of PTFE.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 1, 3-5, 7-9, 11-14, 16, 18-21 and 23-24 (according to the claim renumbering as indicated above) are rejected under 35 U.S.C. 102(b) as being anticipated by the Japanese publication JP 11-339846.

The instant application is directed to an anodic zinc electrode wherein the disclosed inventive concept comprises the specific Zn to ZnO weight ratio. Other limitations include the specific solubility modifiers; the specific hydrogen gas suppressant; the specific binding agent; additionally, the electrochemical cell comprising the anodic zinc electrode and the method of manufacturing the same are claimed.

With respect to claims 1, 5, 9, 16:

The JP'846 publication teaches a sealed alkaline-zinc storage battery including a positive electrode (5) containing an active material; a separator (6), a negative electrode (7) and a negative current collector (4); an alkaline electrolyte; wherein the amount of an uncharged active material and zinc are to be packed in the negative electrode in manufacture of the sealed alkaline-zinc storage battery (ABSTRACT/SECTION 0027-0028).

The JP'846 publication further discloses the negative electrode including mixtures of zinc (Zn) and zinc oxide (ZnO) in various ratios. It is disclosed that the resultant mixture is kneaded to give a paste wherein the paste is applied and adhered onto an outer surface of a negative current collector (SECTION 0022).

Table 3 lists the amounts of zinc and zinc oxide among other constituents used in each battery (SECTION 0036/TABLE 3). Table 3 below as partly included herein shows the following:

【表3】

電池	Zn (g)	ZnO (g)
本發明電池 A 1 3	1.5	2.5
本發明電池 A 3 1	1.5	1.5
本發明電池 A 3 2	1.5	1.0
本發明電池 A 3 3	1.5	0.5

It is apparent from Table 3 above that for specific examples of Battery A31, A32 and A33, the Zn-to-ZnO weight ratio is 1:1 (for Battery A31), 1.5:1 (for Battery A32) and 3:1 (for Battery A33).

With respect to claims 3, 7, 11, 18:

It is disclosed that the negative electrode can include an additive for increasing hydrogen overpotential in order to suppress the generation of a hydrogen gas during storage. Examples of the additive include: diindium trioxide (In_2O_3) (SECTION 0022).

With respect to claims 4, 8, 12, 19:

It is disclosed that the mixture of the negative electrode contains carboxymethyl cellulose (CMF) and polytetrafluoroethylene (PTFE) (SECTION 0022).

With respect to claim 13, 20:

It is disclosed that conventional sealed alkaline-zinc storage batteries uses as the positive electrode active material MnO_2 (*manganese dioxide*) (SECTION 0015, 0010).

With respect to claim 14, 21:

It is disclosed an example of a material for the positive electrode includes hydroxide of nickel which has an $\alpha\text{-Ni}(\text{OH})_2$ crystal structure (SECTION 0016).

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With respect to claims 23-24 (former claims 24-25):

The JP'846 publication discloses the preparation of negative electrode includes mix zinc (Zn) and zinc oxide (ZnO) in various ratios along with other constituents; wherein the resultant mixture was kneaded to give a paste; wherein the paste was applied and adhered under pressure onto an outer surface of a negative current collector (SECTION 0022). *The proportions of the total amounts of all of the negative electrode constituents are illustrated in Tables 1-3. In particular, Table 3 shows the following:*

【表3】

電池	Zn (g)	ZnO (g)
本發明電池A 1 3	1.5	2.5
本發明電池A 3 1	1.5	1.5
本發明電池A 3 2	1.5	1.0
本發明電池A 3 3	1.5	0.5

It is apparent from Table 3 above that for specific examples of Battery A31, A32 and A33, the Zn-to-ZnO weight ratio is 1:1 (for Battery A31), 1.5:1 (for Battery A32) and 3:1 (for Battery A33).

Thus, the claims are anticipated.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 2-3, 6-7, 10-11 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese publication JP 11-339846 as applied to claims 1, 5, 9 and 16 above, and further in view of Charkey 5460899.

The JP'846 publication is applied, argued and incorporated herein for the reasons above. However, the JP'846 publication does not disclose the specific zincate solubility modifier; and the specific hydrogen gas suppressant (*as applicable to the recited MARKUSH group in claims 3, 7, 11 and 18*).

With respect to claims 2, 6, 10 and 17:

Charkey discloses a sealed zinc secondary battery and zinc electrode therefor (TITLE) wherein the zinc negative electrode comprises a zinc active material and $\text{Ca}(\text{OH})_2$ (ABSTRACT/ COL 1, line 62 to COL 2, line9). It is disclosed that $\text{Ca}(\text{OH})_2$ is added to the zinc active material to reduce the solubility of the active material (col 1, lines 34-42/ COL 2, lines 10-16).

With respect to claims 3, 7, 11, 18:

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Charkey also discloses that the zinc negative electrode comprises a metallic matrix formed from a metallic oxide more electropositive than zinc; and useable metallic oxide materials are PbO, CdO and Bi₂O₃ among others (COL 2, line 62 to COL 3, line 3). These claims are further rejected herein in order to address the limitations of the recited MARKUSH group).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to add the specific zincate solubility modifier of Charkey in the zinc negative active material of the JP'846 publication as Charkey teaches that by adding such modifier the shape change of the zinc negative electrode is reduced due to the production of calcium zincate which remains thermodynamically stable and substantially insoluble as a result of the electrolyte concentration. Thus, the additive Ca(OH)₂ is added to the zinc active material to reduce the solubility of the active material. Moreover, the zinc negative electrode retains its conductivity in spite of electrolyte constituents due to its conductive matrix. Accordingly, it provides a zinc negative electrode and zinc secondary battery with reduced shape change and solubility of the zinc electrode and increased cycle life for the battery.

As to the specific hydrogen gas suppressant, it would have been obvious to one skilled in the art at the time the invention was made to add the specific hydrogen gas suppressant of Charkey in the zinc negative active material of the JP'846 publication as Charkey teaches that zinc negative electrodes comprise a metallic matrix formed from the specific metallic oxide more electropositive than zinc. Accordingly, the specific compounds are useable metallic oxide materials which are more electropositive than zinc and are easily reduced to metal during charging without lowering the hydrogen overpotential of the respective electrode.

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10. Claims 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Japanese publication JP 11-339846 as applied to claims 9 and 16 above, and further in view of the Japanese publication JP 62-143368.

The JP'846 publication is applied, argued and incorporated herein for the reasons above. However, the JP'846 publication does not expressly disclose the cathodic electrode comprising silver-oxide.

As to claims 15 and 22:

The JP'368 publication discloses an alkaline-zinc storage battery wherein silver oxide is added to manganese dioxide to make a positive active material (ABSTRACT).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the cathodic electrode comprising silver-oxide of the JP'368 publication in the electrochemical cell of the JP'846 publication because the JP'368 publication teaches that by using silver oxide as part of the positive active material in an alkaline zinc storage battery, a battery that is excellent in a pressure proof characteristic is obtained.

Accordingly, the silver oxide provides an excellent charging characteristic along with the pressure proof characteristic, and hence, an enhanced or more controlled voltage and charging current characteristic in the battery system is obtained. Further, the generation of oxygen from the positive electrode during charge can be suppressed.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Raymond Alejandro
Examiner
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A handwritten signature in black ink, appearing to read 'RAM', is positioned to the right of the typed name and title.